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ABSTRACT

Variations in the number of doctoral degrees awarded by Swedish universities since 1890 are being studied. Within a certain field of study, variations are found both at a national level between different periods, and at an institutional level between different universities. The focus is on the faculties of liberal arts, divinity, social science, and science during the period 1890-1940. A limited number of disciplines since 1940, mainly within the humanities and the social sciences, are also considered. The 1890-1940 period was characterized by limited numbers and sizes of available grants for postgraduate studies, as well as limited opportunities for university teaching positions. The analysis focused on the number of doctoral degrees for each of the four areas of study as well as for specific disciplines, and the number of degrees compared to the rate of increase in the number of professorial chairs. In future stages of the project attention will be directed to dissertation developments and the specific professional labor market conditions for doctoral degree graduates, as well as differences between universities in dissertation developments. Also considered in the project are comparisons with other Nordic countries in doctoral degrees awarded. (SW)

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NEW PROJECT

TITLE OF PROJECT: THE ECOLOGY AND MERIT-VALUE OF POSTGRADUATE STUDIES

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Purpose

The purpose of the project is to describe and explain the quite considerable variations in the number of doctoral degrees awarded by Swedish universities during different periods since 1890. Within a certain field of study, variations are found both at a national level between different periods and at an institutional level between different universities over time and within a certain period.

Postgraduate studies are regarded as an educational process, which is often extended over a long period of time. The testing of different models of explanation takes its starting-point in some theories within educational research and in a comparative perspective. The analysis covers both external frame-factors related to various societal conditions and internal factors within the specific institutions, e.g. the competence, research orientation and attitudes of the professors, the characteristics of the postgraduate students as well as other resources available in terms of staff and research funds. The

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main emphasis is on the faculties of liberal arts, divinity and science before 1940, but for some areas within the humanities and the social sciences the analysis will include also the development during more recent decades.

Background studies

There is a background in two earlier investigations which may be regarded as pilot-studies to the present project.

The first of these studies concerns the development of the Swedish system of higher education in terms of professorial chairs in different faculties. Here a comparison was made with the other Nordic countries (Dahllöf 1982a). In three main respects Sweden was found to deviate from Finland and Norway and in two respects also from Denmark.

(1) In relation to the population, Sweden - and Denmark - proved to have a considerably lower number of chairs (and other similar permanent research positions) than Finland and Norway (Fig. 1). Thus, Sweden in 1980 had only 163 chairs per million inhabitants as compared with 293 for Finland and 240 for Norway.

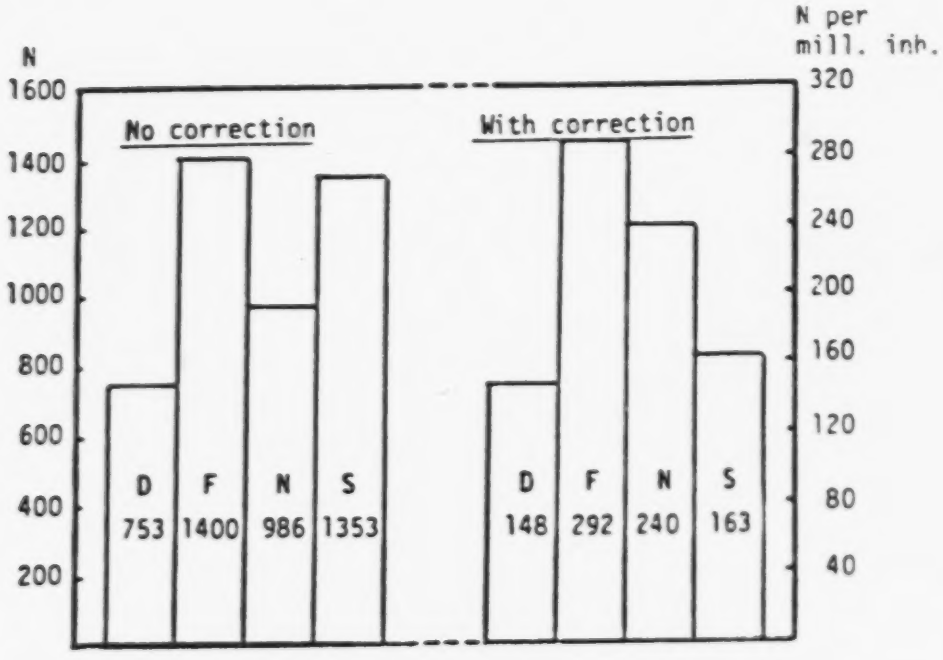

Figure 1. Number of permanent research positions (PRPs) 1980 in four Nordic countries. Totals (left) and with correction for differences in population size (right).
D = Denmark F = Finland N = Norway S = Sweden
(From Dahllöf 1982a, Fig.1).

Even in absolute numbers, the universities in Finland had a slightly larger number of chairs (N=1400) than the Swedish universities (N=1353).

(2) When the total numbers referred to above are broken down into two main groups of faculties, another difference is revealed. The faculties of arts, divinity, law and social science form one of these groups, which was named "cultural sciences". The remaining "natural sciences" contain the faculties of science and technology, medicine, dentistry, pharmacy, agriculture, forestry and veterinary surgery. In Sweden only 23 per cent of all chairs belong to cultural sciences as compared with 35-40 per cent in the other Nordic countries (Table 1).

Table 1. Distribution of permanent research positions (PRPs) with respect to cultural and natural sciences. Per cent of all positions in 1980. (From Dahllöf 1982a, Table 1).

Groups of faculties	Denmark	Finland	Norway	Sweden
Cultural sciences	39	39	36	23
Natural sciences	61	61	64	77
TOTAL	100	100	100	100

This means that Sweden's academic profile is very heavily loaded towards the natural sciences, especially medicine and technology which account for the greatest number of chairs within that group (438 and 302 out of a total of 1034 according to Dahllöf 1982b, Table 4).

(3) The development of the Swedish system when related to population size ran quite parallel to the other Nordic countries up to about 1960. After that, the other Nordic Countries expanded their systems much faster, particularly in the cultural sciences (Fig. 2).

The notably rapid growth in Finland and Norway has a special background in their regionalization policy (cf. Antikainen 1980, 1981, Bie 1981, Kyvik 1980), while Sweden met "the student explosion" in the 1960s by creating new positions, viz university lecturers who entirely took over the undergraduate teaching from the professors in the faculties of arts, science and social science (cf. Dahllöf 1977, Premfors & Östergren 1978).

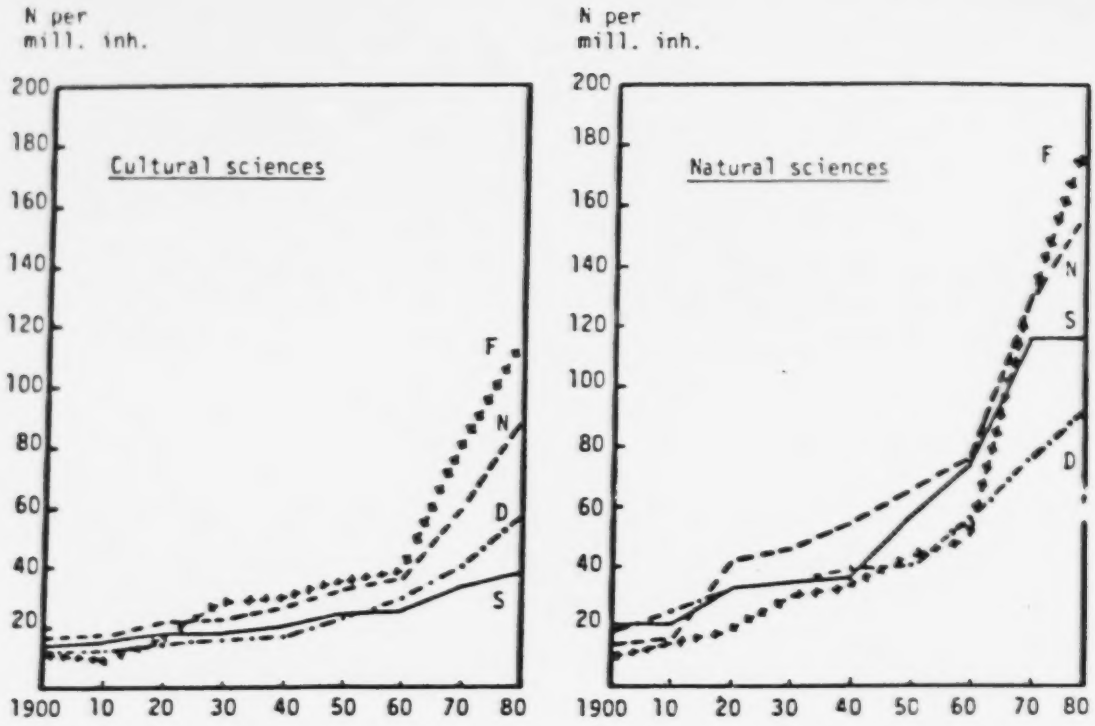

Figure 2. Development of permanent research positions (PRPs) 1900-1980 in relation to the populations size in four Nordic countries. (From Dahllöf 1982a, Fig. 3).

The other background study (Dahllöf 1984a) described the development of education as an academic discipline in Sweden up to the 1940s with special regard to the number and kind of doctoral dissertations and the links and dependencies between professors of different generations. In those days the professors of education also had to take responsibility for the teaching of psychology. The first professor of education in Sweden was appointed at the University of Uppsala in 1910 (Bertil Hammer), the second in Lund in 1912 (Axel Herrlin). A third chair was created in 1913 in philosophy and education in Gothenburg but the first appointment was not made until 1919. The new professor was G.A. Jæderholm, who by the way had studied some time in London (cf. Pearson & Jæderholm 1914). Then it was not until the mid-1930s that a fourth professor was appointed in Stockholm (David Katz).

From the present project's point of view, the main outcome of the study of the chairs in education is the following. In Uppsala and Lund, 7 Ph.D.s were conferred during the period 1910-19. But in spite of the new Gothenburg chair, the number decreased in the 1920s and in the 1930s only two dessertations were

published in the whole country. This decline, however, could not entirely be put down to unexpected vacancies. Instead, another possible influence was found externally in terms of the societal demand for Ph.D.s in this area. Such formal demands had been created at about 1918, when the posts of head teachers of psychology and education at the teacher training colleges were converted into senior lectureships, to which should be added the professorships. During the 1920s and 1930s, however, the number of new vacant positions of this type did diminish, partly due to a reduction of the number of colleges, which in turn was a response to the declining birth rates.

It is true that this explanation is highly hypothetical since the total number of positions involved is so small. Nevertheless, it raised the principal question of a possible market influence on the universities, which may have affected the Swedish system of higher education much more in other disciplines. The main reason for this is the specific Swedish tradition that even head-teachers in senior secondary schools should hold a Ph.D. If our observation of a certain correlation between the number of dissertations in Education and the development of the specific professional market for Ph.D.s at the teachers' colleges as any power as an indication of a more general relationship, then a corresponding co-variation should be found in the disciplines which have a similar but much greater market also in the senior secondary schools.

Problems

The background outlined above gives rise to the following three questions as the main issues of the new project.

(1) How has the number of doctor's degrees in Sweden been developing in various faculties and disciplines during different periods since 1890?

(2) Can any general relationship be traced between the number of doctoral degrees awarded on the national level and the development of employment opportunities in fields of study with a special professional market implying formal or real demands for a doctor's degree?

(3) To what extent is it possible to find other greater differences in the number of doctor's degrees awarded by different universities and university

colleges than those reflecting the mere size and growth of the institutions in terms of the number of professors and graduate students? How can such differences be explained?

Working plan

The project started on July 1, 1985. Some basic issues had, however, been subject to a preliminary analysis at an earlier stage thanks to a planning grant.

The main emphasis of the project is on the period 1890-1940, which is characterized by scarce conditions not only in terms of the number and size of available grants for postgraduate studies but also in terms of the chances to get a position at the university after graduation or a research grant of any size. A limited number of disciplines, mainly within the humanities and the social sciences, will, however, be analysed even after 1940, when economic conditions gradually improved. In addition, some comparisons will also be made with the other Nordic countries. The project work is planned to proceed according to the following time schedule.

Year 1 (1985/86): Mainly studies of differences between periods on a national level including some intensive case studies in education, history and some other subjects.

Year 2 (1986/87): Mainly analyses of differences between institutions as well as some Nordic comparisons on a national level.

Year 3 (1987/88): Remaining analyses and main report.

Dissertation developments after 1890

During the period 1890-1940 the number of professorships increases at quite a steady rate. Therefore we might also expect the number of doctoral dissertations to increase correspondingly. The problem is, whether this also holds true within the different faculties and disciplines. If not, dissertation developments cannot be explained solely with reference to the general expansion of higher education and research in Sweden. In the pilot study in education we found that the number of dissertations diminished during the 1920s and 1930s in spite of the increase in the number of chairs. Are other areas subject to similar fluctuations

or was this pattern unique to education? If a linear relationship is found between dissertation developments and the number of chairs, the other questions about the specific market relations as well as conditions related to the institutions, staff and individual professors will of course become less relevant as explanatory factors.

Since the problem of dissertation developments is so fundamental to the other problems raised in the project, it was taken up at a preliminary stage, thanks to an earlier planning grant. Therefore we are now already in a position to report some main findings on that issue (Dahllöf 1985).

The basis for the analysis is the complete bibliographies of Swedish dissertations for the period 1890-1939 by Nelson (1911) and Tuneld (1945). The specific methodological problems, e.g. related to (the very few) candidates who failed the examination but who returned once again with another or slightly amended dissertation will not be treated here. The main point is, that with respect to our specific problem, a candidate is counted only once within the same faculty.

The first set of data covers the disciplines now belonging to the faculties of arts, divinity, social science and science. The analysis was made at three levels, (1) the grand total for these faculties (Fig. 3) also in relation to the rate of increase of the number of professorial chairs, (2) the faculties (Fig. 4), (3) group of disciplines (Fig. 5) and single subject areas (Fig. 6).

It is evident from Fig. 3 that the grand total is closely related to the steady increase of the number of chairs. However, already at the faculty level - where the number of chairs also increases steadily although that is not shown in Fig. 4 (cf. Dahllöf 1985, Fig. 2:3) - some variation between ten-year periods is introduced.

When it comes to the groups of disciplines (Fig. 5) and the single subject areas (Fig. 6), from which only examples are shown here, the variations between periods increase considerably, to such an extent that it is not possible to regard them as a mere reflection of the general increase of the number of chairs in the respective fields. Consequently we have good reasons to proceed to the problem of the specific labour market conditions in the next step of the analysis.

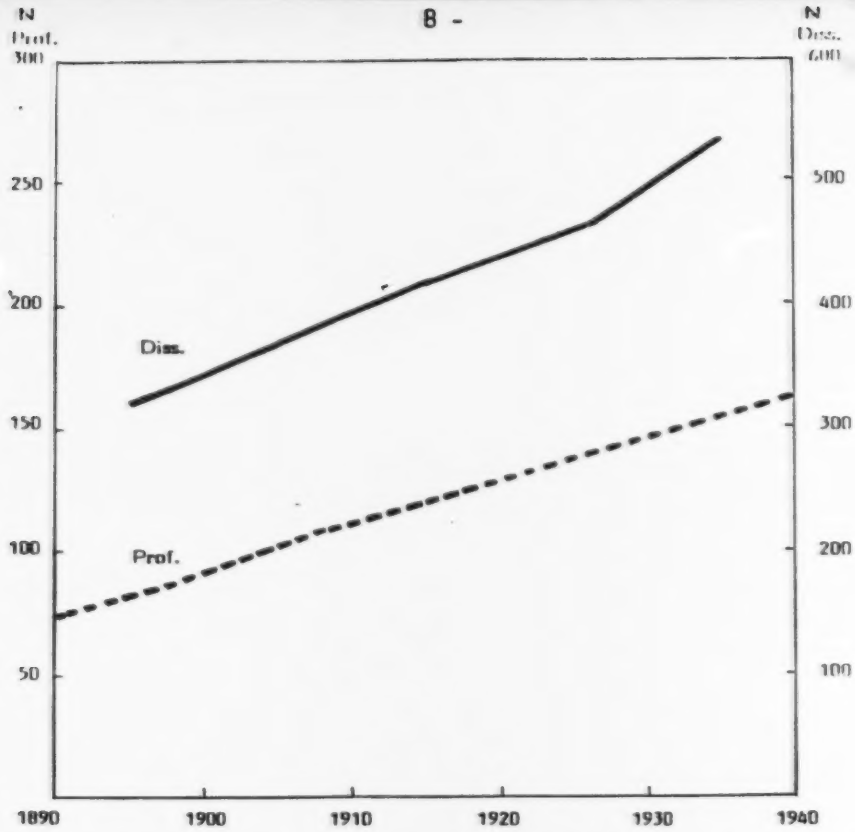

Figure 3. The professorships and dissertations 1890-1939 in the faculties of Arts, Divinity, Social Science and Science. Grand totals. (From Dahllöf 1985, Fig. 2:1).

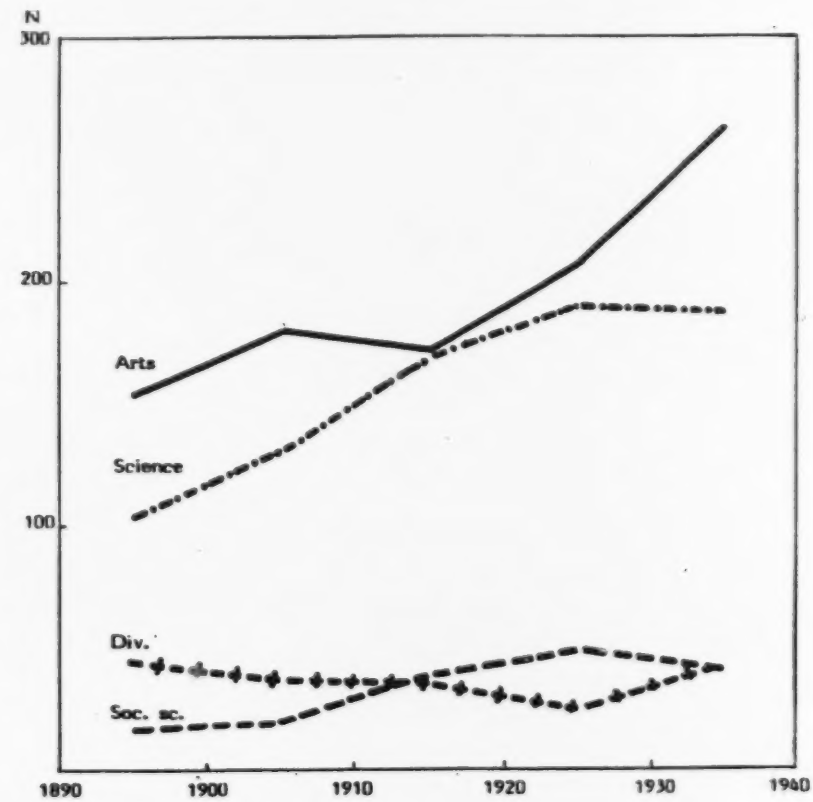

Figure 4. The dissertations 1890-1939 in the faculties of Arts, Divinity, Social Science and Science. (From Dahllöf 1985, Fig. 2:4).

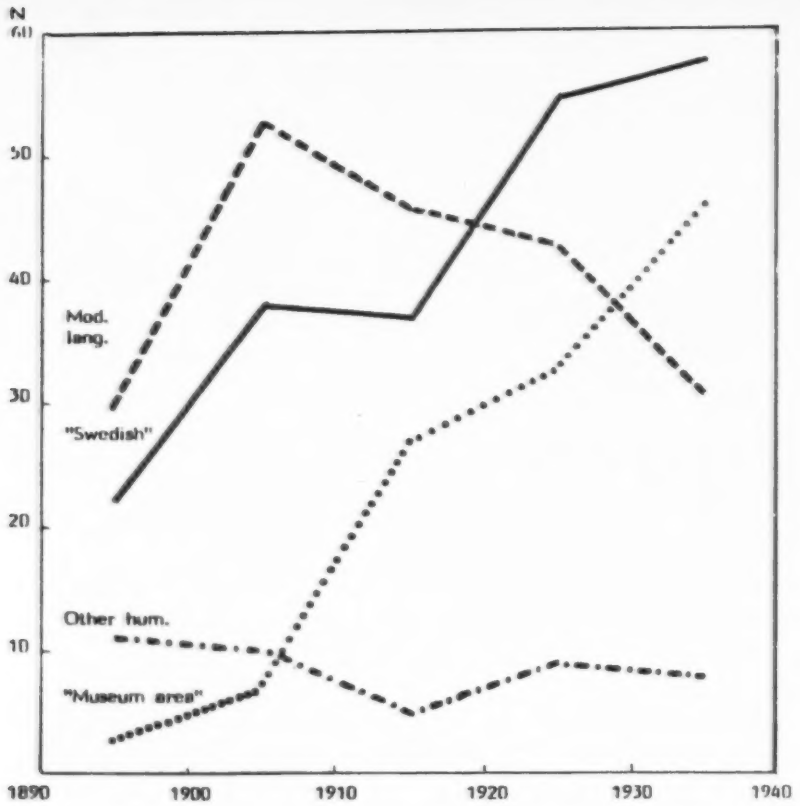

Figure 5. The dissertations 1890-1939 in the subject groups of Modern Languages, Nordic Languages and History of Literature, "the museum area" (Nordic Archæology, Nordic Ethnology and History of Art) and other humanistic areas. (From Dahllöf 1985, Fig. 2:6).

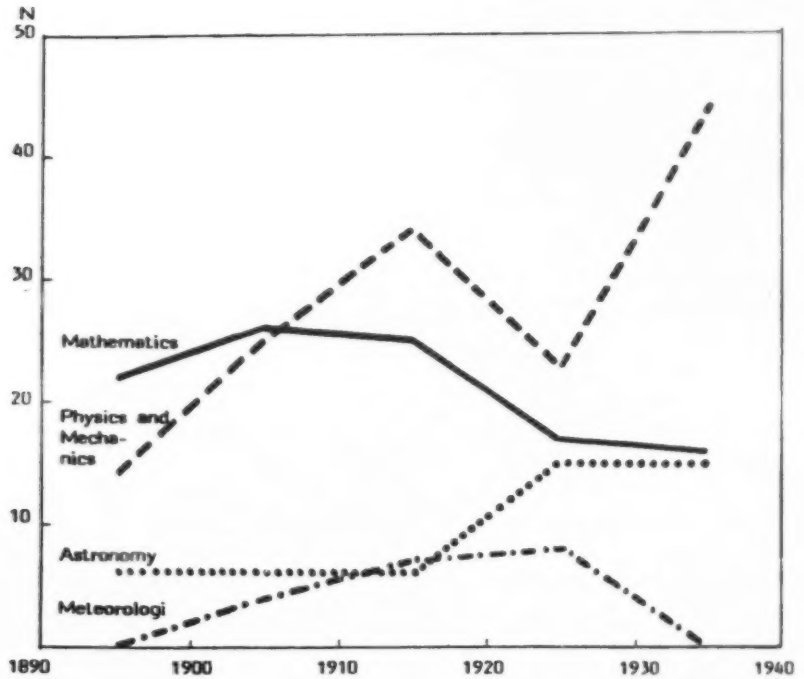

Figure 6. The dissertations 1890-1939 in some science disciplines. (From Dahllöf 1985, Fig. 2:8).

Dissertation developments and the specific professional labour market conditions for people holding a Ph.D.

A number of methodological problems have to be met in the following analysis. We cannot deal with them in any detail here, merely point out some basic requirements. One of them is that it must be possible to single out the type of positions for which there is a formal or real demand for a Ph.D. in the particular subject under analysis. Another requirement is that for a given period, of, say, 10 years we need a measure of the total number of **new** appointments as professor or senior lecturer at a teachers' college or an upper secondary school. Thus, appointments which mean that a previously appointed lecturer gets a "transfer" to a new (and hopefully more attractive) position should not be counted. A third requirement is that we have to make allowance for the fact that a great number of lecturers are appointed to teach at least two subjects in a secondary school, while they should hold their Ph.D. in only one area.

Finally, we should also indicate a possible link to some general models within educational theory. If the assumption of a more general relationship between the number of dissertations and new positions on the specific professional labour market holds true, this means that societal factors external to the universities may exert an important influence on the extent to which different disciplines will be populated by postgraduate students and subject to their research. If so, this in turn means that in a given research field at the university, the external market conditions might impose invisible but real constraints on the number of postgraduate students at least in terms of a base-line which is not surpassed by more than a limited number of people. Such a constraining influence of an external factor may be regarded as a special case of the way in which so-called frame-factors of different kinds impose restrictions on educational processes in the classroom at curricular as well as system level when it comes to the selection of contents, choice of options and study programs etc. (cf. Dahllöf 1967, 1974, Lundgren 1972, 1977, 1979).

Differences between institutions

In the next step institutional differences in dissertation frequency will be analysed with a certain emphasis on variations which do not reflect the growth of the research organization of the particular institutions. Thus, one expects,

almost a priori, an increase in the number of dissertations at Stockholm during the decade following the creation of new chairs there and a corresponding loss of postgraduate students at the old neighbour university of Uppsala.

At this stage we will also take up the problems of qualitative productivity in terms of good dissertations and the extent to which doctors from a certain institution later became professors. In the pilot study of education there were indications of a weak relation between the technical and/or theoretical research competence of the professor and the extent to which his department generated many and good new doctors and professors. Instead, at least at an initital stage of the development of a discipline, a more decisive role seemed to be played by other personality and attitudinal factors among the professors combined with situational components in terms of demand for new doctors and enrolment of postgraduate students "at the right moment". In theoretical terms this also points to some kind of field theory as a possible alternative explanation (Dahllöf 1984b, p. 2). There is, however, not yet any more substantial support for such an alternative interpretation. The issue is raised here only as a warning signal against taking for granted that the most productive researcher training environments under all circumstances are found around the most prominent professors. At least in small countries like the Nordic ones and during times of expansion from a low level of development, other factors may be operating than in the leading big nations and in times of an established normal science.

Urban Dahllöf
February 1986

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